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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/982,454	10/17/2001	Kiyoshi Satoh	ASMJP.100AUS	7409.

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EXAMINER

CROWELL, ANNA M

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 09/05/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

TC-6

Office Action Summary	Application No.	Applicant(s)	
	09/982,454	SATO ET AL.	
	Examiner	Art Unit	
	Michelle Crowell	1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on October 17, 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 18-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 1-20 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>5</u> . | 6) <input type="checkbox"/> Other: |

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-17, drawn to an apparatus, classified in class 118, subclass 725.
 - II. Claims 18-20, drawn to a method, classified in class 438, subclass ----.
2. Inventions II and I are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case, the apparatus is capable forming a film at various pressures.
3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.
4. During a telephone conversation with Katsuhiro Arai on August 28, 2002 a provisional election was made without traverse to prosecute the invention of Group I, claims 1-17. Affirmation of this election must be made by applicant in replying to this Office action. Claims 18-20 withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Priority

5. Acknowledgment is made of applicant's claim for foreign priority based on an application filed in Japan on October 10, 2000. It is noted, however, that applicant has not filed a certified copy of the 2000-318994 application as required by 35 U.S.C. 119(b).

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 4 and 13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

8. Claim 4 recites the limitation "said concave surface" in line 1. There is insufficient antecedent basis for this limitation in the claim. Examiner suggests deleting "surface" and inserting --portion--.

9. Claim 13 recites the limitation "said concave surface" in line 1. There is insufficient antecedent basis for this limitation in the claim. Examiner suggests deleting "surface" and inserting --portion--.

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

11. Claims 1, 2, 4, 6, 8-11, 13, 15, and 17 are rejected under 35 U.S.C. 102(a) as being anticipated by Inokuchi et al. (Japanese Patent Publication-2001-127142).

Referring to Drawings 1, and the abstract, Inokuchi discloses a semiconductor manufacturing device which is positioned in a reaction chamber (plasma CVD apparatus). The device comprises a supporting surface 11a, 12a, 13a . The supporting surface 11a, 12a, 13a has a concave portion including a spherical slanting surface. The device further includes heating elements 6 and 7 embedded below the concave portion, and an external ring 3 (ring-shaped lip). In addition, a mechanical mechanism is not required to hold the wafer W on the susceptor 11, 12, 13.

Referring to Drawing 2, the supporting surface 21a, has a concave shape with an inner supporting surface 23a (flat portion) and an outer supporting surface 22a (slanting portion).

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. Claims 3 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inokuchi et al. (Japanese Patent Publication-2001-127142) in view of Yamada et al. (U.S. 4,986,215).

Inokuchi fails to teach a conical surface.

Referring to Figure 8a, and column 1, lines 27-36, Yamada vapor-phase growth system teaches a susceptor 1-2 having a V-shaped susceptor 1-2 (conical, substrate-supporting surface 1-2). The V-shaped susceptor 1-2 holds the substrate without mechanical means and provides uniform heat transfer across the substrate. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the supporting surface of Inokuchi with the conical, substrate-supporting surface as taught by Yamada. This would hold the substrate without mechanical means and provide uniform heat transfer across the substrate.

14. Claims 5 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inokuchi et al. (Japanese Patent Publication-2001-127142) in view of Hurwitt et al. (U.S. 5,925,226).

Inokuchi fails to show a distance between the substrate's back surface and the concave surface's center ranging between 0.05 mm to 0.3 mm.

Referring to Figure 3a and column 4, lines 15-22, Hurwitt shows a gap size 28 between the backplane surface 24 (supporting surface) and the wafer 12 is 0.002 inches (0.0508 mm.). A uniform distribution of a predetermined temperature on a wafer is maintained using the specific

gap size. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention for the space between the substrate and susceptor of Inokuchi to have the gap size as taught by Hurwitt. This would maintain a uniform distribution of a predetermined temperature on a wafer.

15. Claims 7 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inokuchi et al. (Japanese Patent Publication-2001-127142) in view of Bedi et al. (U.S. 6,094,334).

Inokuchi fails to teach a radio-frequency electrode.

Referring to Figure 1 and column 4, lines 1-23, Bedi teaches a metal electrode 125 that electrostatically holds the substrate 25. The electrode 125 is embedded in the polymer 120. It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the susceptor of Inokuchi with the electrode as taught by Bedi. This electrode allows the wafer to be held electrostatically.

Claim Rejections - 35 USC § 102

16. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

17. Claims 1, 2, 8-11, and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Gurary et al. (U.S. 6,001,183).

Referring to Figures 1 and 8a, column 5, line 55 – column 6, line 57, and column 9, lines

24-34, Gurary discloses a wafer carrier 200 (substrate supporting surface) with a bottom surface 537 having a spherical surface. A resistance heating element 114 may be positioned below the susceptor. The wafer 140 is held in the wafer pocket 634 using no mechanical mechanism. The wafer carrier further includes an annular ring 150 spaced on the outer periphery of the upper surface. This wafer carrier/susceptor is used during an epitaxial deposition process.

Claim Rejections - 35 USC § 103

18. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

19. Claims 3 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gurary et al. (U.S. 6,001,183) in view of Yamada et al. (U.S. 4,986,215).

Gurary fails to teach a conical surface.

Referring to Figure 8a, and column 1, lines 27-36, Yamada vapor-phase growth system teaches a susceptor 1-2 having a V-shaped susceptor 1-2 (conical, substrate-supporting surface 1-2). The V-shaped susceptor 1-2 holds the substrate without mechanical means and provides uniform heat transfer across the substrate. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the supporting surface of Gurary with the conical, substrate-supporting surface as taught by Yamada. This would hold the substrate without mechanical means and provide uniform heat transfer across the substrate.

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20. Claims 4 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gurary et al. (U.S. 6,001,183) in view of Tsukuyama (Japanese Patent Publication 01-283813).

Gurary fails to show a concave portion having a slanting portion and a flat portion.

Referring to the abstract and Drawing 1, Tsukuyama shows a susceptor 2 with a recessed pocket having a spherical surface and a flat surface. This susceptor's design restrains the generation of slipping dislocation, dispersion of resistivity, and the thickness of the silicon epitaxial layer. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the supporting surface of Gurary with the conical, substrate-supporting surface as taught by Yamada. This susceptor's design restrains the generation of slipping dislocation, dispersion of resistivity, and the thickness of the silicon epitaxial layer.

21. Claims 5 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gurary et al. (U.S. 6,001,183) in view of Hurwitt et al. (U.S. 5,925,226).

Gurary fails to show a distance between the substrate's back surface and the concave surface's center ranging between 0.05 mm to 0.3 mm.

Referring to Figure 3a and column 4, lines 15-22, Hurwitt shows a gap size 28 between the backplane surface 24 (supporting surface) and the wafer 12 is 0.002 inches (0.0508 mm.). A uniform distribution of a predetermined temperature on a wafer is maintained using the specific gap size. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention for the space between the substrate and susceptor of Gurary to have the gap size as taught by Hurwitt. This would maintain a uniform distribution of a predetermined temperature on a wafer.

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22. Claims 6, 7, 15, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gurary et al. (U.S. 6,001,183) in view of Bedi et al. (U.S. 6,094,334).

Gurary fails to teach an embedded, heating element and an embedded, radio-frequency electrode.

Referring to Figure 1 and column 4, line 54 – column 5, line 35, Bedi teaches a resistive heating element 145 which is embedded in the heater 130 (substrate-supporting surface). This resistance heating element is used to increase the heat applied to the substrate 25 in small amounts. It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the susceptor of Gurary with the heating element as taught by Bedi. This resistance heating element would increase the heat applied to the substrate 25 in small amounts.

Referring to Figure 1 and column 4, lines 1-23, Bedi teaches a metal electrode 125 that electrostatically holds the substrate 25. The electrode 125 is embedded in the polymer 120. It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the susceptor of Gurary with the electrode as taught by Bedi. This electrode allows the wafer to be held electrostatically.

Conclusion

23. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michelle Crowell whose telephone number is (703) 305-1956.

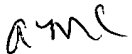
The examiner can normally be reached on M-F (8:00 - 4:30).

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills can be reached on (703) 308-1633. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

AMC 
September 3, 2002


GREGORY MILLS
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700